Amendments to the Claims

1. (Currently amended) A method of making a mathematical model of a spinal cord, comprising:

a) measuring positions of a spinal cord at a plurality of vertebral levels of a patient, each measurement comprising the step of deriving a single point corresponding to each vertebral level,

b) constructing and storing a plurality of two-dimensional graphs representing cross-sections of ~~the patient's~~ a human spinal cord at locations corresponding to said plurality of vertebral levels, wherein said two-dimensional graphs are independent of any measurement performed on the patient, and

c) stacking said plurality of two-dimensional graphs ~~according to the positions measured in step (a)~~ so as to produce a three-dimensional model of at least a portion of the spinal cord, wherein each two-dimensional graph is placed in a location corresponding to the corresponding position measured in step (a).

2. (Original) The method of Claim 1, further comprising causing the patient to assume each of a plurality of positions, wherein the measuring step is performed for each of said plurality of positions, and wherein steps (a) through (c) are performed for each of said plurality of positions.

3. (Original) The method of Claim 1, further comprising comparing the three-dimensional model of the spinal cord to data stored in a database, the database containing similar data obtained from other

patients.

4. (Original) The method of Claim 2, further comprising comparing the three-dimensional models of the spinal cord to data stored in a database, the database containing similar data obtained from other patients.

5. (Original) The method of Claim 1, wherein step (b) includes the step of simulating a stress applied to at least one portion of the spinal cord, wherein the three-dimensional model represents at least a portion of the spinal cord in a perturbed condition.

6. (Original) The method of Claim 5, further comprising comparing the three-dimensional models of the spinal cord to data stored in a database, the database containing similar data obtained from other patients.

7. (Original) The method of Claim 1, wherein the two-dimensional graphs are produced by dividing cross-sections of the spinal cord into a plurality of finite elements, wherein the three-dimensional model produced in step (c) is formed of a plurality of finite elements.

8. (Currently amended) A method of making a mathematical model of at least a portion of a spinal cord, comprising:

a) measuring positions of a spinal cord at a plurality of vertebral levels of a patient, <u>each measurement comprising the step of deriving a single point corresponding to each vertebral level,</u>

b) constructing <u>and storing</u> a plurality of two-dimensional graphs

representing cross-sections of ~~the patient's~~ a human spinal cord at a plurality of vertical locations, wherein said two-dimensional graphs are independent of any measurement performed on the patient, the two-dimensional graphs being assembled from a plurality of finite elements, the finite elements being coded according to a neurological function of a region of the spinal cord in which said element is located, and

c) stacking said plurality of two-dimensional graphs according to the positions of the spinal cord measured in step (a) so as to produce a three-dimensional model of at least a portion of the spinal cord, wherein each two-dimensional graph is placed in a location corresponding to the corresponding position measured in step (a), wherein said three-dimensional model is made of a plurality of finite elements.

9. (Original) The method of Claim 8, further comprising repeating steps (a) through (c) for each of a plurality of positions assumed by the patient.

10. (Original) The method of Claim 8, further comprising comparing the three-dimensional model with data collected in a similar manner from other patients.

11. (Original) The method of Claim 9, further comprising comparing the three-dimensional model with data collected in a similar manner from other patients.

12. (Original) The method of Claim 8, wherein step (b) also comprises simulating a stress applied to at least a portion of the spinal

cord, wherein the two-dimensional graphs and the three-dimensional model represent the spinal cord in a perturbed condition.

13. (Original) The method of Claim 12, further comprising comparing the three-dimensional model with data collected in a similar manner from other patients.

14. (Currently amended) Apparatus for making a mathematical model of a spinal cord, comprising:

a) means for measuring positions of a spinal cord at a plurality of vertebral levels of a patient, wherein the measuring means comprises means for deriving a single point corresponding to each vertebral level,

b) means for constructing and storing a plurality of two-dimensional graphs representing cross-sections of ~~the patient's~~ a human spinal cord at a plurality of vertical locations, wherein said two-dimensional graphs are independent of any measurement performed on the patient, and

c) means for stacking said plurality of two-dimensional graphs according to measured positions determined by the measuring means, so as to produce a three-dimensional model of at least a portion of the spinal cord.

15. (Original) The apparatus of Claim 14, further comprising means for comparing the three-dimensional model of the spinal cord to data stored in a database, the database containing similar data obtained from other patients.

16. (Original) The apparatus of Claim 14, further comprising means for simulating a stress applied to at least one portion of the spinal cord, wherein the three-dimensional model represents at least a portion of the

spinal cord in a perturbed condition.

17. (Original) The apparatus of Claim 16, further comprising means for comparing the three-dimensional models of the spinal cord to data stored in a database, the database containing similar data obtained from other patients.

18. (Original) The apparatus of Claim 14, wherein the constructing means comprises means for dividing cross-sections of the spinal cord into a plurality of finite elements, wherein the three-dimensional model is formed of a plurality of finite elements.

19. (Currently amended) Apparatus for making a mathematical model of at least a portion of a spinal cord, comprising:

a) means for measuring positions of a spinal cord at a plurality of vertebral levels of a patient, wherein the measuring means comprises means for deriving a single point corresponding to each vertebral level,

b) means for constructing and storing a plurality of two-dimensional graphs representing cross-sections of ~~the patient's~~ a human spinal cord at a plurality of vertical locations, wherein said two-dimensional graphs are independent of any measurement performed on the patient, the two-dimensional graphs being assembled from a plurality of finite elements, the finite elements being coded according to a neurological function of a region of the spinal cord in which said element is located, and

c) means for stacking said plurality of two-dimensional graphs according to the positions of the spinal cord at said vertebral levels measured by the measuring means, so as to produce a three-dimensional model

of at least a portion of the spinal cord, wherein said three-dimensional model is made of a plurality of finite elements.

20. (Original) The apparatus of Claim 19, further comprising means for comparing the three-dimensional model with data collected in a similar manner from other patients.

21. (Original) The apparatus of Claim 19, wherein the constructing means includes means for simulating a stress applied to at least a portion of the spinal cord, wherein the two-dimensional graphs and the three-dimensional model represent the spinal cord in a perturbed condition.

22. (Original) The apparatus of Claim 21, further comprising means for comparing the three-dimensional model with data collected in a similar manner from other patients.